

GENELEC®

CASE STUDY

**Genelec's discreet,
low-level ambience
soothes children**

NEW CHILDREN'S
HOSPITAL IS DESIGNED
FROM A CHILD'S
PERSPECTIVE





GENELEC HELPS CREATE AWARD-WINNING SOUNDSCAPE IN NEW CHILDREN'S HOSPITAL IN HELSINKI, FINLAND

The New Children's Hospital (HUS) in Helsinki is one of a kind. Over a million Finns contributed funds to build the new €170M state-of-the-art facility which welcomed its first patients in late 2018. Focused on demanding, specialised health care for children, the new facility is a case study in patient-centric design that uses art and play – both recognised as key elements for

a 'healing environment' - combined with the latest digital technology to provide the highest quality medical care in a safe, reassuring environment for the children and their families.

Part of the hospital's innovative approach included the development of a building-wide soundscape to create a soothing sonic environment for patients and staff. Genelec is proud to have contributed to this unique

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endeavour with the provision of nearly 100 loudspeakers, including 39 Genelec 8430A IP SAM™ loudspeakers which serve the soundscape project and were donated outright. Indeed, the soundscape design was recently awarded the Grand Prix in the soundscapes and ambient sound category of the 2019 International Sound Awards (ISA) in Hamburg.

The project was led by paediatrics specialist, Pekka Lahdenne, head of digital and innovations services at HUS who engaged Miikka Peltomaa, an ENT (Ear, Nose & Throat) specialist and keen musician. Dr Peltomaa's brief was to create the best possible sound experience in one of the world's most modern children's hospitals. "My role was kind of CEO of the project," he says with a smile. "I chose the professionals and collaborators for the venture, for which we had no budget, begged for donations (which was fun and easy) and looked after the project as it developed. The project steering group consisted of me and

Dr Outi Ampuja. Outi is an adjunct professor at the university of Helsinki and a recognised expert in noise analysis and the effects of noise, sound and silence on the human body. Her input was invaluable."

The idea was to create a soundscape based on the visual theme of each of the hospital's eight floors, starting in the underground car park. Inspiration was drawn mostly from the natural world as well as the much-loved Finnish Moomin stories; the ocean theme for the underground carpark gives way to the shore at ground level, through valleys, forests and mountains all the way up the stairs on level eight. Dr Peltomaa recruited Antti Ikonen, Head of Sound in New Media at Aalto university and ten of his MA students for the mammoth task of developing the content.

"Firstly, the sound is generative, not looping, to avoid stress and ear fatigue," explains Antti. "All the audio material is hosted in a single

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computer which generates and renders the soundscapes before feeding them out to each floor and location via the hospital's IP network. Each soundscape contains ingredients from real sound environments like the ocean, the forest, the jungle, blended with all sorts of other elements that we either created or recorded ourselves or sourced from sound libraries. It was a huge undertaking."

"The design and planning started before the building even existed," he continues. "We discussed with the architects, doctors, electrical engineers, IT people, and Genelec how to implement this holistic technological system. The idea was not to fill the building with background music but to create a discreet, low-level ambience that is pleasurable and soothing for the kids but won't disturb nurses or other staff."

A crucial element of the design was speaker placement, which was determined at the very outset of the project and effectively designed

into the building to facilitate cabling and infrastructure. The soundscape is delivered via 39 Genelec 8430A IP SAM loudspeakers and ten AIC25 in-ceiling loudspeakers distributed throughout the hospital's lobbies and corridors from the underground car park all the way up to the top floor. They are specifically not located in proximity to the nurses' workstations so as not to disturb hospital staff, and neither are they found in patients' rooms, operating theatres, meeting rooms or any other space that has a specific function.

"The huge advantage of using IP networked loudspeakers is that there's no need for traditional audio cables when connecting the loudspeakers to the sound source (in this case an Apple Mac Pro computer running the audio engine). Without IP audio, the sound system would have required hundreds of metres of audio cable and would have been vulnerable to many kinds of interference," explains Antti.



“In an IP audio network, the signal is conveyed as data via the ethernet cables of the computer network. In other words, the sound system is utilising a network which exists anyway. This, of course, is a huge cost saving. And last but not least, there’s no loss in the signal chain and the audio is reproduced perfectly in full quality.”

Jon-Patrik Kuhlefeldt, sound technician and digital audio specialist from the Sibelius Academy at Helsinki’s University of the Arts, also played an important role in the technical system design and content planning for the soundscape. “The heart of the system is the Mac Pro running a Max/MSP patch,” he confirms. “A Focusrite REDNET PCIeR audio interface in the Mac Pro feeds Dante streams to a BSS BLU-806DA DSP processor, that is used mainly for muting all the loudspeakers in case of a fire alarm. From there, the outputs are fed to the Genelec 8430A IP SAM loudspeakers via AES67. Finally, we have a Focusrite REDNET AM2 feeding the AIC25s.”

“All system tuning and individual loudspeaker configuration is done directly in the Max patch rather than in the loudspeakers themselves, for the simple reason that if ever we need to exchange a loudspeaker for any reason,

all we have to do is swap it out, configure the IP address and select the correct input stream – the new loudspeaker is automatically configured as the old one was, so there is much less risk of altering the sonics of the system by accident. Finally, since the Mac Pro is connected to the hospital’s existing IT infrastructure, we can easily control the system from anywhere in the hospital via VNC (remote desktop) using the hospital’s Wi-Fi. That’s a big help when working with a large distributed system like this.”

Another point worth mentioning is that because all of the Genelec speakers are active, there is no need to worry about finding room for amplifier racks. “There are nearly 100 Genelec loudspeakers throughout the building in total – in addition to those used for the soundscape project, there are over fifty 4000 Series loudspeakers [mainly the compact 4020Cs] found in meeting rooms and conference areas throughout the hospital – that would have been a lot of amplifiers to house!” says Miikka Peltomaa.

The final word goes to Antti Ikonen: “Genelec was an ideal partner for such an ambitious and challenging project as the New Children’s Hospital soundscape. In addition to providing the loudspeakers, Genelec helped the sound design team to resolve the technical issues which were inevitable in such pioneering work. We’re all very proud of what we’ve achieved here and hope it will be the blueprint for many projects to come.”



THE KIT

- 39 x 8430A IP
- 10 x AIC25
- 48 x 4020C
- 2 x 4030C
- 2 x 4040A
- 1 x 7370A

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